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AUTHOR Fradd, Michael; Malassa, Donald
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ABSTRACT

Findings from a study that assessed the use of computers in secondary schools and computer awareness in the Solomon Islands are presented in this report. A brief report of a conference based on the survey findings is attached. Methodology involved three survey instruments: questionnaires administered to 421 out of 1,978 secondary students enrolled in forms 3 and 5; questionnaires sent to 22 secondary and 2 primary schools; and phone surveys of 102 businesses and 19 ministry departments. Of the 421 students surveyed, 20% (83 students) had used a computer. Conclusions are that an urgent need exists for a standardized educational policy on computer hardware and for general software guidelines. Appendices include the three survey instruments, the conference program and participants, a policy draft, and 12 recommendations for improving facilities and awareness. (6 references) (LMI)

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Ministry of Education and Human Resources Development

Microcomputers in Schools

Michael Fradd and Donald Malassa

Honiara October 1991

Curriculum Development Centre

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Forward

The numbers of computers in businesses, government departments, schools and homes is increasing rapidly. Some schools have been teaching aspects of information technology and using computers for clubs and activities, administration and computer assisted learning.

There is need for a policy on standardisation of hardware and software in schools so that schools can reap the benefits of standardisation and also avoid costly mistakes. The school curriculum, secondary in particular, needs to reflect these changing needs of students entering a more technological society.

The receipt of the Commonwealth Secretariat publication: - Microcomputers in Schools: Policy and implementation Guide-lines earlier this year was the impetus needed for the Curriculum Development Centre to take action on the matter.

A survey of students, schools, businesses and government departments was carried out to determine the present situation and this was used as a basis for a conference which made a number of proposals and produced a draft policy on micro computers in schools.

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SURVEY

Acknowledgements

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Introduction

Computers have already made their mark in industry, commerce and education all over the world, including Solomon Islands.

Several secondary schools, one primary school and SICHE already have micro computers which are used by students. Proposals are being put forward by these organisations and others for the purchase of computers and software and their incorporation into the curriculum.

Many business in Solomon Islands now use computers in their everyday running and need to employ people with computer awareness and keyboard skills not provided by the present curriculum. The number of such businesses is growing and plans need to be made for the future so that school leavers have appropriate skills.

The School Leaver Tracer Survey indicates that 11.8% of form 3 leavers (those who do not go on to form 4) take up clerical positions, in many of which keyboard skills would be useful. There is no similar information available for form 5 leavers.

Solomon Island Students, particularly mature students, going overseas are at a distinct disadvantage if they have never used a computer before.

The Commonwealth Secretariat gives four main reasons for using computers in schools.

1. To build a resource of people who are highly skilled in the use of information technology.
2. To equip all students for a future in which technological awareness and basic computer skills will be increasingly important for greater numbers of citizens.
3. To use new technology to enhance the existing curriculum and to improve the way in which it is delivered.
4. To promote change in education by moving towards a more relevant curriculum and a new definition of the teacher's role.

Since schools already use computers there is a need to establish guide-lines now on what hardware and software to purchase in future to avoid costly mistakes. Standardisation will allow for the benefits of bulk buying, local technical support and maintenance, and being able to transfer data and expertise from one educational establishment to another.

The Curriculum Development Centre of the Ministry of Education and Human Resources Development decided to hold a one day conference on Micro-computers in schools which would produce guide-lines on hardware and software and make recommendations about how Information Technology might be incorporated into the present secondary school curriculum. The participants to be invited include representatives from:-

- Curriculum Development Centre
- Schools with computers and those without.
- Ministry of Education and Human Resources Development
- Organisations utilizing school leavers:-
 - Businesses
 - Tertiary Education - USP, SICHE
 - Hardware and software retailers.
 - Parents
 - Churches

There is very little information available about the present state of Information Technology in schools. The School Leaver Tracer Survey gives some insight into the use made of the content of their education by students who leave school at the end of form 3. The MEHRD document on period allocation for secondary schools lays down subjects that must be taught. It does not include Information Technology in any form although at least one school does teach typing to forms 2 and 3.

As preparation for this conference a survey of students, schools, businesses and Ministries was carried out to determine the present position regarding computers in the community and knowledge of them among secondary school students. This report details the results of the survey.

For the purposes of this report, Honiara schools is taken to mean those six schools which have vehicular access to Honiara. That is Betikama Adventist High School, King George VI, St Joseph's, Tenaru and Selwyn College, National Secondary Schools, Honiara Secondary School and Ruavatu Provincial Secondary School. The other sixteen National and Provincial Secondary schools are taken as non-Honiara schools.

Survey Design

Three instruments were prepared, tested and refined before the final versions were used or sent out. They are included as appendices A - C. The same instrument was used for both businesses and for Ministries and Government Departments.

Students and Schools

A questionnaire was given to form 3 and form 5 students from certain schools. These give a representative selection from NSS and PSS, Honiara schools and those in the provinces. The selection could not be random but the instrument was administered to students at all schools being visited by Curriculum Development Officers during the period of the survey and to some in the Honiara area as well.

A questionnaire was sent to all 22 secondary schools. Two private primary schools were included since it was known that one had computers and that no government primary schools did. Any non-response could be compensated for by reference to records of Curriculum Development Officers visits to the schools in the last year.

Businesses and Ministries

The sampling method used was systematic sampling from the Government Departments, Ministries and Statutory Bodies section of the 1991 Telephone Directory and the yellow pages for businesses. The entries in both sections were numbered consecutively and a random number chosen. This number entry was selected and every fifth entry after it to give a 20% sample.

There should be no problem of periodicity as entries are arranged in sections and each section arranged alphabetically. Samples came from every Government Ministry, each sub-section of the yellow pages and from each of the seven provinces (the survey was carried out before Choiseul became a province).

It was decided to carry out a phone survey rather than to mail Questionnaires to increase the rate of response and this was amply justified in the 100% response from businesses as opposed to the 32% response rate from the mailed survey to schools.

Analysis of the Data

Businesses

There are 624 businesses included in the 1991 yellow pages. The 20% sample included 2 that operate from PNG, 2 that have gone out of business and 18 were duplicate entries. The remaining 102 businesses were phoned, resulting in a 100% response rate which must be some indication of the interest in the education system amongst the business community.

Of the 102 businesses contacted, 30 use computers.

The computers used are as follows:

IBM compatible	- 40
Apple/Macintosh	- 11
Mini computers	- 3
Compugraphic Typesetter	- 1

All the microcomputers had hard disks, 29 had both 5 $\frac{1}{4}$ " and 3 $\frac{1}{2}$ " drives, 9 had only 5 $\frac{1}{4}$ " drives and 9 had only 3 $\frac{1}{2}$ " drives.

Numbers of computers using different types of software were as follows:

Word Processor

Wordstar	21
MS Word	6
Word Perfect	6
Framework	4
Appleworks	2
Unknown	5

Spread Sheet

Lotus 123	19
Quattro	9
Framework	4
Appleworks	2
Unknown	2

Database

dBase	9
Framework	4
Appleworks	2
Excel	2
Unknown	9

Accounting

Attache	13
Turbo Ledger	2
Framework	2
Finance Manager	2
Unknown	7

The unknown entries both here and below in the table for Ministries indicate that the person answering the call did not know brand of software. It was noticeable that a number of the respondents, often those using the software, did not know if it was a database or a spread sheet or even a word processor.

Every business that had computers thought that basic keyboard skills and attendance at a computer awareness course would be useful to school leavers.

None thought it better for school leavers to have no training in keyboard skills or computer awareness so that training could begin from scratch.

None wanted school leavers to have training in specific software applications or in computer programming.

Two businesses made strong pleas for school leavers to have basic English skills as a necessary prelude to knowledge of computer or keyboard skills.

All businesses, whether they used computers or not were questioned about the number of school leavers they expected to take on in the next five years. The total number came to 776, of whom 187 or 24% would be expected to type or use a computer.

Ministries and Government Departments

There are 110 separate departments listed in the 1991 Telephone Directory. Of the 22 surveyed, a response was obtained from 19.

Nine of the departments use computers, 10 do not.

The computers used are as follows:

IBM compatible	- 10
Apple/Macintosh	- 2

Numbers of computers using different types of software were as follows:

Word Processor

Word Perfect	5
Wordstar	3
Framework	2
Unknown	1

Spread Sheet

Lotus 123	4
Quattro	1
Unknown	1

Database

dBase	4
Gem star	1
Paradox	1
Unknown	3

Accounting

Unknown	2
---------	---

Schools

Four secondary schools and one primary school at present have and use computers. There are 2 IBM compatible machines, 1 Apple and a number of outdated Amstrad CPC464/6128 as well as 2 inoperable BBC machines. The only business software used is Wordstar and Bytesize word processors.

Four of these five schools plus one other secondary and one other primary school have current plans for obtaining more computers.

Every school replying felt that basic keyboard skills would be useful to school leavers.

Students

The Ministry of Education figures for students enroled in forms 3 and 5 in secondary schools in 1991 are as follows, the figures in brackets show the sample size used in the survey:-

<u>Form 3</u>	<u>Male</u>	<u>Female</u>	<u>Form 5</u>	<u>Male</u>	<u>Female</u>
NSS Honiara	193(46)	113(39)	NSS Honiara	168(40)	78(34)
Non Honiara	184(46)	72(17)	Non Honiara	143(46)	64(14)
Total	377(92)	185(56)	Total	311(86)	142(48)
PSS Honiara	53(26)	54(14)			
Non-Honiara	544(71)	312(28)			
Total	597(97)	366(42)			
Total	974(189)	551(98)			

Thus a sample of 421 students from a total of 1978 was used.

The 83 students, representing 20%, who said that they had used a computer were distributed as follows:-

<u>Form 3</u>	<u>Male</u>	<u>Female</u>	<u>Form 5</u>	<u>Male</u>	<u>Female</u>
NSS Honiara	22	19	NSS Honiara	15	20
Non Honiara	3	0	Non Honiara	2	1
Total	25	19	Total	17	21
PSS Honiara	0	0			
Non-Honiara	1	0			
Total	1	0			
Total	26	19			

Of these 83, only 7 claimed to know a lot about computers.

The occasions they had used computers were given by these 83 students as:-

20	club time
15	science lessons
13	at home
10	work experience
7	with friends or relatives
5	primary school
4	maths lessons
3	free time at school
3	work sessions
2	business office
2	business studies lessons
1	part-time job

They gave these as the reasons they had used computers:-

53	games
15	typing letters
7	school/club accounts
6	drawing and designing
1	writing programs

They said that they had learned to use a computer from:-

41	relatives and friends
24	science teacher
14	work session teacher
4	maths teacher
1	business studies teacher

Given a choice between the following statements the students answered as follows:-

170	Computers are useful tools in industries and offices.
143	Computers are useful for higher studies.
90	Most employers use computers at work.
5	Computers in schools will be no use at all.
2	Computers will help the school to grow more food.

302 or 72% of students thought that it would be a wise idea to spend school money on computer equipment if it were available. They were distributed as shown on the next page, the figures in brackets show the percentage of the sample for that group:-

<u>Form 3</u>	<u>Male</u>	<u>Female</u>	<u>Form 5</u>	<u>Male</u>	<u>Female</u>
NSS Honiara	33(72%)	26(67%)	NSS Honiara	33(83%)	28(82%)
Non Honiara	29(63%)	8(47%)	Non Honiara	34(74%)	13(93%)
Total	62(67%)	34(61%)	Total	67(78%)	41(85%)
PSS Honiara	13(50%)	6(43%)			
Non-Honiara	55(77%)	24(86%)			
Total	68(70%)	30(71%)			
Total	130(69%)	64(65%)			

Summary and Conclusions

It is clear that IBM compatible micro-computers dominate the market. Those in use in the country have hard disks and most incorporate both 5 $\frac{1}{4}$ " and 3 $\frac{1}{2}$ " floppy drives.

There is obviously an urgent need for a policy on standardisation of hardware in schools given the diversity in place at present and the plans for the future.

The position with software is much less clear cut. Wordstar just has the edge as a word processor, Lotus 123 as a spreadsheet and Attache for accounting. dBase, if any, is the most widely used database software. However, employers would prefer students to have a general understanding of what each of these classes of software is, rather than specific training in any particular one. It is quite definite that at present no-one sees a need for students to know about computer programming as taught in many traditional computer studies courses abroad.

It is unlikely that standardisation of software for schools would be useful or even possible but guide-lines could be set.

Students who have used computers come mainly from the Honiara area, many of those from the rural areas actually used a computer in Honiara rather than locally. This shows the advantage students have in attending Honiara area schools. Most students all over the country have a reasonable idea of what a computer is and what it can do.

Students are being taught some aspects of Information Technology in schools and are learning some at home and in the community at large. A review of how this can be incorporated into the school curriculum is needed.

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Appendix A

Ministry of Education and Human Resources Development

Curriculum Development Centre

Computer Awareness Survey

School Form Sex M F

The Curriculum Development Centre is working towards producing a 'Computers in Schools' policy. In order to do this, we need to find out how much knowledge you have on computers. Your assistance in answering this questionnaire will be very much appreciated. Answer by writing the appropriate letter.

1. How much do you know about computers?
a) a lot b) not much c) only mentioned by teacher
d) only read about it

2. Does your school have a computer? a) Yes b) No

3. Have you used a computer before? a) Yes b) No

If your answer is Yes then answer questions 4, 5 and 6. If your answer is No then go on to question 7.

4. Have you used a computer during :- a) work sessions b) Maths class
c) Business Studies class d) Club time e) At home f) Other, specify?

5. Have you used a computer for:- a) Typing letters b) Keeping school/club's business accounts c) Drawing and designing d) Games e) Writing programs?

6. I learned to use a computer from my :- a) Maths teacher b) Science teacher c) Business studies teacher d) Work master/mistress e) Parents f) Friends.

7. Choose which ONE of these statements you think is correct.
a) Computers will help the school grow more food.
b) Most employers use computers at work.
c) Computers are useful tools in industries and offices.
d) Computers are useful for higher studies.
e) Computers in schools will be no use at all.

8. If your school has enough money to spend on school equipment do you think it is a wise idea to spend it on a computer?
a) Yes b) No

Appendix B

Curriculum Development Centre Computers in Schools Survey

Computers are becoming more widespread both in business and in schools. CDC is hoping to hold a conference to produce a set of Computers in Schools guide-lines. The conference should produce a report with recommendations for standardisation of hardware and software as well as help for CDC in its review of the curriculum in the area of Information Technology. This survey is to provide the needed background material for this conference. Your help in filling out and returning this form in the enclosed envelope will be very useful. No stamp is needed on the envelope, just enclose the form and mail it.

School

1. Do you think that basic keyboard skills would be
useful to school leavers? Yes No

2. Does your school have any computers? Yes No

If your answer to 2 is no, leave the rest of the questions and mail
this questionnaire now.

3. How many computers do you have in your school?
IBM compatible Apple Other (specify)

4. What processors do they use (if known) Eg for IBM, 8088
(XT) or 80286 (AT) etc.

5. What data storage system do you use? Hard disk
5 $\frac{1}{4}$ " disks 360 kb ... 1.2 Mb ... 3 $\frac{1}{2}$ " disks 720 kb ... 1.44 Mb ...
cassette other

6. What software do you use?
word processor Yes Name No
database Yes Name No
spreadsheet Yes Name No
accounting Yes Name No

7. What is the computer normally used for?
Administration ... Clubs ... Demonstration lessons/simulations ...
Class teaching ... Other (specify)

8. Who uses your computer(s)?
Secretary ... Administration staff ... Teachers ... Students ...

Appendix C

Ministry of Education and Human Resources Development

Curriculum Development Centre

Computer Awareness Survey

An increasing number of businesses in Solomon Islands are using computers. The Curriculum Development Centre of MEHRD will shortly be holding a conference on Computers in Schools. This survey is being carried out so that the needs of the business community can be assessed and taken into account in future reviews of the secondary school curriculum. Please take time to fill in this form and mail it in the stamped, addressed envelope provided (no stamp needed!). Thank you for your co-operation.

Name of Business Box No

1. How many school leavers does your company expect to take on over the next 5 years?
2. How many of these will need to use computers or typewriters?
3. Does your company use computers or you expect to be using computers within the next five years? Yes No
4. Would a representative of your company be interested in attending the proposed conference on computers in schools? Yes No.....

If your answer to 4 was No, please stop here and mail this now.
If your answer to 4 was Yes, please continue.

5. How many micro-computers does your company use?
IBM compatible Apple Other (specify type)
6. What data storage system do you use? Hard disk... 5 $\frac{1}{4}$ " floppies ...
3 $\frac{1}{2}$ " floppies other
7. Do you use any of the following types of software?
word-processor... Name database ... Name
spreadsheet ... Name accounting ... Name
8. What keyboard skills do you think school leavers should have ?
None so that we can train them ourselves from scratch
Basic typing/keyboard skills
Attendance at a computer awareness course
Use of- word-processor spreadsheet
database accounting software
simple programming other - specify

CONFERENCE

PROGRAMME

8.30	Participants arrive.	
9.00	Official opening:-	Gabriel Taloikwai, MEHRD
9.15	Opening Remarks:-	M. Fradd, CDC
9.30	Hardware Presentation:-	J. Granada, Harvest Pacific
10.00	Morning Tea	
10.30	Group Discussions:-	D. Malasa, CDC
11.30	Reports from Groups:-	D. Malasa, CDC
12.00	Lunch	
1.30	Information Technology in the Curriculum:-	M. Fradd, CDC
2.00	Group Discussions:-	D. Malasa, CDC
2.30	Afternoon Coffee	
3.00	Reports from Groups:-	D. Malasa, CDC
4.00	Concluding Remarks:-	M. Ramoni, CDC

Participants

Organisation

Wryne Bennett	Curriculum Development Centre
Ted Berry	Solomon Islands College of Higher Education
W. Fischer	Pacific Technology
Mike Fradd	Curriculum Development Centre
Sr Christiana Garo	Curriculum Development Centre
Jesse Gibson	Harvest Pacific Ltd
Hilda Kii	Curriculum Development Centre
Geraldine Laka	Curriculum Development Centre
Donald Malasa	Curriculum Development Centre
Charles Manata	Curriculum Development Centre
Joash Maneipuri	Solomon Islands College of Higher Education
Sr. Claire O'Brien	Curriculum Development Centre
Br. Peter Page	St Josephs, Tenaru, National Secondary School
Norm Pont	National Bank of Solomon Islands
James Porakari	St Josephs, Tenaru, National Secondary School
Thomas G. Pyatt	Ruavatu Provincial Secondary School
Len Raj	Solomon Islands College of Higher Education
Johnson Moffat Ramoni	Curriculum Développement Centre
Reini Steed	Chung Wah School
Henry J. Tobani	Ruavatu Provincial Secondary School
Kerapuke Toben	Curriculum Development Centre

Draft Policy for standardisation of micro computer hardware and software in schools.

Hardware.

1. - Local purchase of hardware is preferable

This will mean that support, repair and maintenance are available.

2. - In all cases equipment should be IBM compatible.

Local suppliers may be able to provide maintenance for IBM compatibles. Other machines would definitely require overseas repairs.

The majority of business house use IBM compatible software.

3. - Minimum hardware configuration should be

12 MHz AT 286 or preferably 386.

At least 40 MB capacity hard disk

3½" or 5¼" high density floppy drive or preferably both

At least 1MB Random Access Memory.

VGA colour display if possible

Current release of MS DOS

The cabinet should include space for expansion.

This represents the best 'value for money' configuration.
Later upgrading is a much more expensive option.

Software.

If they have the choice, schools should use the following software:-

- | | |
|-----------------|-----------------------------------|
| - Wordprocessor | Word Perfect, Wordstar or MS Word |
| - Spreadsheet | Lotus 123 |
| - Database | dBase |
| - Accounting | Attache. |

Recommendations

1. The draft policy should be approved as soon as possible and distributed to schools.
2. There should be an annual survey of business to determine hardware and software in current use.
3. Software manufacturers should be contacted to negotiate country wide site licences for software for educational establishments.
4. There should be centralised control of installation of software in schools.
5. Teacher orientation courses on aspects of hardware and software should be instituted.
6. There should be liaison between MEHRD and SICHE over software in use.
7. Subscriptions to computer magazines should be arranged to keep the system up to date.
8. The post of computer coordinator should be set up to deal with items 2-7. This could be based in the computer room at CDC.
9. The subject of Information Technology is of sufficient importance to the development of the nation's greatest resource, the students, to warrant a comprehensive review of the secondary curriculum. The review should bring the subject material into line with international standards and contemporary requirements of the nation.
10. As interim measures, CDC or the coordinator should investigate how computers can be used in the present curriculum
Eg. Games to familiarise students with computers and keyboards.
Word Processors in English and other subjects
Spreadsheets in Maths
Computer Aided Learning (CAL) in Social Studies etc.
Computer Aided Design (CAD) for Technical Drawing etc.
11. Should schools at some future date have facilities for teaching information technology, then this should be accepted and encouraged.
12. SICHE's offer of a computer awareness course for form 5 students as part of their interview week should be taken up.